High performance human resource management in Ireland and the Netherlands

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Chapter 5

Identifying types of HR management

1.0 Introduction

Adopting HR practices demands considerable time and money from a firm, both for incorporating the practices into operations and to oversee their on-going, day-to-day implementation. Given the extent of set-up and running costs, is it reasonable to expect a firm to invest in all five of the practices included in the high performance HR bundle. This chapter approaches the prediction of whether a firm will implement the bundle first by considering the costs and benefits the firm can expect to face when adopting the bundle of practices. Recall from Chapter 2 the full high performance bundle includes five HR practices: incentives, relational signals, guidance, training and selectivity. Because each practice represents a considerable investment to a firm, does the adoption decision simply boil down to picking and choosing from among the five?

The logical conclusion to the theoretical ideas outlined in Chapter 2 suggests that any firm hoping to maximise the benefits from its HR investment is unlikely to embark upon such a pick-'n-mix approach. In fact, the essence of the idea of complementarity among the practices suggests that unless all five are in place, a firm runs the risk of forsaking the full potential of the practices. To recap this arises because while each practice is expected to improve certain aspects of employee performance, each is also limited in the scope of its effect and, in some instances, may even be detrimental to some employee performance outcomes. This implies that, in order for a firm to maximise the employee performance potential of any one of the high performance HR practices in which it invests, it must apply complementary practices that will not only reinforce but also flank or support as well as mitigate the less favourable effects of the practice.

Returning to the original question of whether the firm can be expected to invest in all five high performance HR practices, the strengths and weakness of each of these practices, combined with the firm's desire to maximise the potential of its

HR investment, imply that the most feasible outcomes would be either investing in the full complement of high performance HR practices or investing in few, if any at all. In terms of the employee performance outcomes, to invest in some – but not all of the bundle implies that, because they are lacking the other complements, these HR practices will yield less than their full potential of returns for the firm. Consequently, it is expected that:

Companies will choose either to use the full complement or none of the five high performance human resource practices.

This chapter examines whether high performance HR practices are used as predicted above, that is to say, whether adoption patterns reveal a bi-modal outcome of a full and low use of the practices. Cluster analysis procedures will be used to examine this question. After a short introduction into the kind of cluster techniques that will be used, the details of the distribution regarding each of the measures of high performance HR practices will be presented. Each practice distribution will be examined separately for Ireland and for the Netherlands. Next, the cluster analyses will be presented and described, followed by an evaluation of the cluster solutions or outcomes. Finally the substantive meaning of the outcomes will be interpreted and discussed in light of the theoretical expectations discussed above.

2.0 Identifying types of HR clusters

Cluster analysis refers to a group of multivariate techniques whose primary purpose is to group objects (i.e. in this study, companies) on the basis of characteristics they possess. Cluster analysis classifies objects "*... so that each object is very similar to others in the cluster with respect to some predetermined selection criterion. The resulting clusters of objects should then exhibit high internal (within-cluster) homogeneity and high external (between-cluster)*

heterogeneity." (Hair et al, 1998, p. 473). Cluster analysis is a deterministic method that unambiguously assigns objects to clusters (rather than probabilistic methods that assign probabilities of belonging to a group). Although there is a wide variety of clustering methods, the two most widely used in the social sciences are *hierarchical agglomerative cluster methods* and the *k-means clustering (non-hierarchical cluster procedures).* Since the purpose of the cluster analysis is to identify the extent to which companies use the five HR practices, it was decided to cluster the companies on the basis of distance measures rather than correlation coefficients, which do not reflect the levels of the clustered variables.

In the HR literature, hierarchical clustering is by far the most common technique used to discuss high performance bundles or types, (see, for example Ichniowski, 1995; MacDuffie, 1994; Arthur, 1992). Recently, probabilistic clustering has also been applied (Wood & De Menzes, 1998). The disadvantage of probabilistic clustering is that the reliable detection of fuzzy clusters requires a considerably large numbers of cases (Bacher, 1996), far exceeding that of the present sample size. Given this, hierarchical cluster analysis may be the most appropriate method for small samples. In relation to medium-to-large sample sizes, however, this technique exhibits severe disadvantages. The irreversibility of the hierarchical cluster procedure may create artificial results, since 'undesirable' early combinations persist and affect the subsequent aggregation of clusters. Moreover, outliers tend to have a strong effect on the clustering process (Hair et al, 1998). Taken together it was considered that a two-stage clustering procedure should be employed which combines hierarchical clustering with a *k*-means clustering procedure. In the next section, the variables to be used in the analyses will be described.

2.1 High performance human resource practices: operationalisation

High performance HR management is operationalised by the extent to which companies use the following five practices:

(1) ***Use of Incentives***: this refers to the importance of performance and skill in determining the compensation and promotion opportunities given to core

employees, the use of performance appraisals, and the awarding of bonuses for individual- and/or team-based merit.

(2) ***"Relational Signals":*** these reflect the level of such pecuniary and non-pecuniary benefits provided by a company to its core employees as high wages, fringe benefits, profit-sharing and promotion opportunities.

(3) ***Guidance***: the extent to which companies provide core employees with guidance and support in the development of their jobs and careers, and to the extent that management and supervisors have clear expectations regarding the behaviour and performance of their employees.

(4) ***Training:*** this variable refers to whether the company has formal training programmes, and the proportion of core employees who receive on- and off-the-job training from the company, or are offered further education opportunities.

(5) ***Selection***: refers to the extent to which companies apply rigorous selection criteria in the recruitment and promotion of their core employees.

See Appendix I for details of operationalisation.

2.2 Distribution of high performance human resource practices in Ireland and the Netherlands

In this section, the distribution of the HR indicators for the two countries is described. The purpose is not only to inform the reader of differences in HR use between the two countries but, given that cluster analysis is particularly sensitive to skewed distribution, also to check the distributions.

The variables used to measure the HR practices do not exhibit a natural scaling. Most of the HR variables have been standardised[1] using the pooled data with the exception of the variable *Relational Signalling*. This exception was made for theoretical reasons: in order for a company to build a reputation among its employees as a generous and fair employer, it is necessary that it appears to be more generous and fair than the average company in the same country. Theoretically, the extent to which a company can be said to exhibit relational signalling is strongly related to the extent to which other companies in the same country offer relational signals. Standardising the relational signalling variable on the basis of the pooled data would result in the loss of this 'relativity' dimension for this concept. In order to retain relativity, it was considered more appropriate to retain the 'own country' dimension by standardising relational signalling for the two data sets separately. In terms of the other four HR activities, the effect of these practices is not primarily one of signalling and therefore, their effectiveness is expected to depend on the absolute level rather than the relative position within a country.

Tables 5.1 and 5.2 present principal summary statistics for the five high performance HR practices in Ireland and the Netherlands. Starting with the Ireland sample, Table 5.1 presents the values for the mean, standard deviation and skewness for each of the five practices. While the distribution of *Incentives* indicates a slight negative skewness, and that of *Guidance* some positive skewness, all of these values, on the whole, are within the range of acceptability of -1 to + 1 (Hair et al, 1998). This indicates that the five skewness values conform to the characteristics for which a cluster analysis can be used.

[1] The use of unstandardised variables can be problematic, because the distance measures applied in cluster analysis are also quite sensitive to different scaling or magnitude among the variables. This implies that, in general, variables with a larger dispersion (i.e. larger standard deviations) exert more of an impact on the final similarity value. For these reasons, it is appropriate to standardise the variables. By converting each of the variables to standard scores (i.e. by subtracting the mean and dividing by the standard deviation), any bias that can occur due to scaling differences will be subsequently reduced.

Table 5.1. Descriptive statistics for High performance HR practices: Ireland

HR practice	Frequency	Mean	Standard deviation	Skewness
Incentives	74	.13	1.10	-.60
Training	76	.32	.90	.22
Relational signals	71	.00	1.00	.04
Guidance	72	.11	1.00	.82
Selectivity	78	.26	1.06	-.25

Table 5.2 presents the mean, standard deviation and skewness values for the Netherlands data. While the distribution of *Incentives* and *Selectivity* variables suggest some negative skewness and that of G*uidance and Training*, positive skewness, the values nevertheless fall within the -1 to + 1 range, again suggesting that they also conform to the characteristics for which a cluster analysis can be appropriate.

Table 5.2 Descriptive statistics for High performance HR practice: Netherlands data

HR practice	Frequency	Mean	Standard deviation	Skewness
Incentives	294	-.03	.97	-.79
Training	301	-.08	1.01	.56
Relational signals	291	.00	1.00	-.00
Guidance	262	-.03	1.00	.94
Selectivity	281	-.07	.97	-.59

To conclude, the measures of the symmetry of the distribution of the company data from Ireland and the Netherlands produce skewness values that do not exceed the threshold over which the distributions would be considered to be substantially asymmetrical. Consequently, the values on both sides of the distributions are

reasonably similar to the 'middle' and the usual measures of location can be also considered to be reasonably similar.

Table 5.3. Means and variance analysis of High performance HR practice

HR practice	t-test	t-test p-value	F-test	F-test p-value
Incentives	1.286	.199	2.341	.127
Training	3.160	**.002**	.454	.501
Guidance	1.033	.302	.009	.924
Selectivity	2.632	**.009**	2.427	.120

Turning to the mean HR values, independent *t*- tests and Levene's F-test for the equality of variance between the countries were conducted in order to clarify the extent of differences between country means. The results of this analysis are presented in Table 5.3. The independent sample *t*-test results indicate there are some significant differences between Ireland and the Netherlands' scores on the five high performance practices. The results indicate that *Training* and *Selectivity* practices provided by companies in Ireland are significantly larger than those provided by companies in the Netherlands. There are no indications that there is significant inequality with regard to the variance of these indicators.

2.3 Results of cluster analysis

As mentioned above, a two-stage cluster analysis that combines hierarchical clustering with *k*-means clustering was used. Hierarchical clustering was used to profile the cluster centres and to identify any obvious outliers. In order to optimise the clusters, the cluster centres identified by the hierarchical method were then used as the initial seed points in a *k*-means clustering procedure. This combination helps to avoid the weakness of *k*-means clustering where the iterative algorithm becomes 'stuck' in a local minimum. Ward's method was chosen as the hierarchical clustering algorithm. This method is said to be the most likely method to discover any underlying cluster structures and follows a similar logic to that of *k*-means clustering. Before presenting the final cluster solution, the

motivation behind the decision will be outlined. Furthermore, the robustness of the cluster solution for the two countries will also be examined.

2.3.1 How many clusters?

Cluster analysis provides no clear decision rule for determining the number of clusters to be selected. However one guideline for hierarchical clustering procedures is that the clustering process should be stopped once very dissimilar clusters are combined. For non-hierarchical clustering procedures, Bacher (2001) suggests variance analytical statistics that formalise this logic for determining the number of clusters to be selected. Bacher also emphasises the importance of interpretability of the cluster solutions (Bacher, 1999). In the following section, these techniques are applied to the examination of between two and fifteen clusters.

Table 5.4 reports the relevant statistics for the solutions derived from this data analysis. The first column reports the within sum of squares of the k-cluster solution (Level). The second column reports the increase of the within sum of squares gained by the step from *k*+1 to *k*-clusters (Deviance). Both of these statistics pertain to the hierarchical cluster process. The third column reports ETA^2 , the share of variance 'explained' by the clusters.[2] The fourth column reports the change in the explained variance relative to the *k*-1 solution (ΔETA^2). The fifth column outlines the proportional reduction of error (PRE)[3] and the final column outlines the F-Max statistics.[4] The heuristics for the ETA^2 is to select the number of clusters *k* such that the subsequent *k*+1 to *k*+n do not substantially improve the explained variance. Consequently, a sharp decrease in Δ ETA^2 and PRE indicates an appropriate value for *k*. The heuristic for F-Max is to select the number of clusters *k* such that F-Max of *k* has the largest value. For *k*=2 this criterion cannot be applied.

[2,3,4] See Appendix end of this chapter

Table 5.4. Statistics of cluster solutions

	Hierarchical		**K-Means**			
	Level	***Deviance***	***ETA²***	***ΔETA²***	***PRE***	***F-Max***
k=1	1,548.36	287.52	.00	N.A.	N.A.	N.A.
k=2	1,262.95	161.15	.27	.27	.27	141.29
k=3	1,057.89	118.24	.37	.10	.14	112.55
k=4	955.72	107.20	.44	.07	.11	99.99
k=5	874.28	68.36	.49	.05	.09	92.18
***k*=6**	**809.21**	**50.21**	**.53**	**.05**	**.09**	**88.51**
k=7	751.05	35.64	.56	.03	.06	82.47
k=8	711.45	35.34	.58	.02	.04	76.11
k=9	677.74	31.62	.59	.01	.03	70.19
k=10	638.48	31.06	.62	.02	.06	68.36
k=11	608.18	30.18	.63	.02	.05	66.09
k=12	582.09	24.56	.64	.01	.02	61.95
k=13	556.68	22.73	.67	.02	.06	62.70
k=14	536.06	21.85	.69	.02	.07	64.12
k=15	516.68	17.68	.68	-.01	-.04	56.32
k=16	498.20					

While, the 2-cluster solution 'explains' 27 percent of the variance, the statistics for the solutions optimised by the *k*-means generally indicate the 6-cluster solution. The F-Max statistic is, strictly speaking, inconclusive (as the highest F-max value is that of the 2-cluster solution), but the change in both ΔETA^2 and PRE clearly recommends that the 6-cluster is the optimal solution. After the 6-cluster solution the ΔETA^2 drops from 5 percent to 3 percent, suggesting that the 6-cluster option as a strong candidate for selection. The same result was derived by a visual inspection of a scree plot (not reported), a graphical representation of the changes in the agglomeration levels.

2.3.2 Robustness of the Six-cluster solution

Thus far, the 6-cluster solution seems most plausible. A question that should be addressed, however, is whether this solution actually reflects a pattern inherent to both countries? For example, it could be that using the pooled sample has the effect that the cluster structure of the Dutch sample is in fact imposed upon and thus dominates the smaller Irish data set. In such an event, the cluster solution could be considered no more than an artefact of pooling the two data sets. In order to clarify these issues, a *k*-means clustering was separately conducted for each country. This procedure was carried out using the cluster centres of the pooled *k*-means cluster analysis as seed points or starting values for the iteration process. One criterion for assessing the robustness of cluster solutions is to examine whether cases are consistently allocated to the same clusters. The first row of Table 5.5 contains measures of comparison between the Dutch cases, classified by a cluster analysis using the pooled data and the Netherlands-specific cluster solution. The second row reports measures of the Irish classifications. The third row contains pooled classifications, which were derived by country-specific clustering using pooled data.

Table 5.5. Statistics to assess the cluster stability of partitioning

	Measures of Agreement		**Robustness of Cluster solution: x^2/df (p-value)**						
	% agree-ment	**Kappa** (p-value)	**Cl 1**	**Cl 2**	**Cl 3**	**Cl 4**	**Cl 5**	**Cl 6**	**All Clusters**
NL	98.7	.984 (.000)	1.58/5 (.904)	0.64/5 (.987)	0.64/5 (.986)	0.06/5 (1.00)	1.09/5 (.955)	0.66/5 (.985)	4.7/30 (1.00)
IRL	85.2	.820 (.000)	7.33/5 (.198)	1,28/5 (.937)	7.84/5 (.165)	7.75/5 (.171)	21.89/5 (.001)	7.83/5 (.166)	53.9/30 (.005)
Comb-ined	95.9	.950 (.000)	8.91/10 (.541)	1.92/10 (.997)	8.48/10 (.582)	7.81/10 (.647)	22.98 /10 (.011)	8.49/10 (.581)	58.6/60 (.527)

Table 5.5 indicates that 98.7 percent of the Dutch companies have been allocated to the same cluster (Column 1). A considerable 85.2 percent of the Irish companies are classified the same way by both procedures. Taken together, 95.9 percent of all companies are thus assigned to the same cluster by a pooled *k*-means clustering and by country specific partitioning. The Dutch classification is therefore nearly exactly reproduced when both methods are applied. The agreement between the two classifications for the Irish data is substantially larger than the 70 percent level frequently applied in the cluster analysis literature as a rule-of-thumb for sufficient stability of cluster solutions (see Bacher 2002, p. 82). In evaluating the agreement between two partitionings, the role of chance must be considered. A familiar measure of agreement that adjusts for the agreement expected by chance is Cohen's kappa coefficient (column 2). This kappa coefficient is very high for the Dutch (.98) and for the combined sample (.95) and satisfactorily high for the Irish sample (.82). In all cases, as indicated by the high significance of the kappa coefficients, the agreement is well above that which would be expected to arise due to chance.

Another criterion for evaluating the robustness of the cluster solutions consists of comparing the cluster centres. Across partitionings, the centres of robust clusters should remain sufficiently similar. A strict test for the stability of the cluster centres is that the null hypothesis – the squared Eucledian distances between the cluster centres of different partitionings is equal to zero – cannot be rejected. Since the variables are only weakly correlated within the clusters ($r > -.11$; $r < .14$; $p > .01$), this hypothesis can be tested by applying the following chi-square statistic (see Bacher 2002: 124ff):

$$\chi^2 = \frac{n_i \cdot n_k}{n_i + n_k} \sum_j \frac{\left(\bar{x}_{ij} - \bar{x}_{kj}\right)^2}{s^2_{j/ik}}$$

where n_i; n_k are the number of cases in partition i and k, respectively;
x_{ij}; x_{kj} are the means of variable x_j for cluster i and k
$s^2_{j/ik}$ is the pooled within-variance of variable x_j for cluster i and k.

This test statistic is chi-square distributed with qp(m-1) degrees of freedom. q is the number of clusters, p the number of variables and m is the number of solutions compared. Table 5.5 reports the chi-square values for all six clusters as well as the values for the entire partitioning. The former is used to test the hypothesis that each of the clusters is stable, while the latter is used to test the hypothesis that all clusters are stable. The chi-square statistic reveals that the centres of all clusters and of the total partitionings do not differ significantly from one another as far as the Dutch and the combined sample are concerned. For the Irish data, Clusters 1, 2, 3, 4 and 6 are stable, while the centres of Cluster 5 differ significantly between the two procedures; this also accounts for the significant differences in the partitionings of the Irish data.

The results above raise the question of whether the different Cluster 5 outcome is substantially important. Before assessing the implication of this shift in Cluster 5 values, an interpretation of the entire 6-cluster solutions is required. Being equipped with a meaningful interpretation of all of the solutions will provide a necessary basis for this assessment.

2.3.3 Interpretation of the six-cluster solution

Table 5.6 presents the results of the 6-cluster solution produced through the application of a *k*-means clustering procedure. The clusters are ordered in the table according to their sum score of the cluster centres (high performance HR bundle scores).

Cluster 1 (n=39) is comprised of companies that exhibit consistently ***high scores*** across all HR practices. Companies in this cluster invest in the full set of high performance HR practices. These are the companies that are expected to strive for the full complementarity effect of high performance HR management. Clusters 2 and 3 are comprised of companies that are prepared to invest in many, but not all, of the high performance HR practices. Cluster 2 companies (n=58) offer high levels of incentives, training and selectivity programmes, but little by way of relational signalling or guidance. In cluster 3 companies (n=80) activities are mainly related to incentives, relational signalling and selectivity. Cluster 6 (n=39)

points to very low use of these practices. Cluster 5, which, having 111 companies, is the largest cluster, follows a similar pattern; companies in this cluster exhibit far below average scores on three practices, but yield average scores on selectivity and incentive practices. The remaining Cluster 4 companies (n=65) are remarkable in their unwillingness to invest in high performance except through a single practice. They are consistently low on four HR practices, but exhibit high levels in 'relational signalling'.

Table 5.6 Results of *k*-means (quick cluster) analysis: 6-cluster solution

HR practices	Cluster centres (z-scores)					
	Cluster 1 n = 39	***Cluster 2 n=58***	***Cluster 3 n=80***	***Cluster 4 n=65***	***Cluster 5 n=111***	***Cluster 6 n=39***
Incentives	.94	.49	.55	-.47	-.11	-1.82
Relational Signals	.56	.03	.84	.75	-.94	-.66
Guidance	1.99	-.15	-.06	.13	-.53	-.60
Training	1.13	1.29	-.26	.03	-.68	-.76
Selectivity	.57	.42	.63	-.80	.08	-1.45
High performance HR bundle score	5.20	2.19	1.75	-.42	-1.06	-5.35

The one cluster that uses all five of the HR practices can be considered to be the type of company that uses the high performance HR bundle that had been predicted in Chapter 2. Two further clusters (2 and 3) are characterised by a selective adoption of the HR practices. Clusters 5 and 6 in contrast, contain groups of companies that can be considered to use none of the HR practices. Cluster 4 appears to be unusual here, as these companies choose to combine high levels of relational signalling with low levels of the other HR practices. In the next section, Cluster 4 will be scrutinised to shed light on this apparent paradox. Having completed this, it is then considered whether the profiles of Cluster 5

companies in Ireland differ significantly from the Dutch Cluster 5 profiles (reported in Section 2.3.2) with regard to the implications for the substantial interpretation that Cluster 5 companies belong to a group that makes little effort in terms of HR management.

Table 5.7: Distribution of clusters per country
Frequency (percentage)

	Country		
HR types	**Ireland**	**Netherlands**	**Total**
Low	7 (9)	32 (10)	39 (10)
Low (*rel sig*)	11 (14)	54 (17)	65 (17)
Low (*select*)	18 (22)	93 (30)	111 (28)
Selective (*Inc, rel sig, select*)	16 (20)	64 (21)	80 (21)
Selective *(Incent, trg, select)*	18 (22)	40 (13)	58 (15)
High	11 (14)	28 (9)	39 (10)

Table 5.7 reports the incidence of the clusters by country. Ten percent of the companies belong to the high performance cluster. The share of companies using the high performance bundle is fourteen percent in Ireland and nine percent in the Netherlands. Thirty six percent of companies of all companies apply a selective form of HR management. These forms of HR management are also more widespread in Ireland (42%) than in the Netherlands (34%). Finally, the majority of companies (55%) employ a low form of HR management. This form is more prominent in the Netherlands (57%) than in Ireland (45%).

2.3.4 Relational signalling and bureaucracy

Under which conditions would companies combine particularly low levels of all the HR practices with high relational signalling? In this section it is argued that these companies belong, as do companies of Clusters 5 and 6, to a group of companies demonstrating little HR activity. These companies are bureaucratic

and therefore tend to be extensive users of formalised versions of fringe benefits. Such formalised practices have little signalling value. First because management has no discretion in the application of these practices, they tend not to be perceived as indicators of the goodwill and benevolent intentions of management. Second, the formalised nature of these benefits implies that employees all too easily perceive the benefits as entitlements rather than 'gifts' to be reciprocated. Being more widely employed by bureaucratic or more traditional companies, the expectation is that other indicators of bureaucracy, such as size, age and unionisation, will distinguish Cluster 4 from other clusters.

Table 5.8: Means of components of relational signalling scale

	Advancement	Wages	Perks
Cluster 1	.00	- .01	.25
Cluster 2	.23	.11	-.17
Cluster 3	.45	-.14	.34
Cluster 4	.30	.05	.57
Cluster 5	- .57	.04	- .52
Cluster 6	- .62	- .05	-.16

As can be seen from Table 5.8 the main component driving the high relational signalling value associated with cluster 4 is the high score in perks programmes. The companies in this cluster also score quite highly on the 'advancement' and, to a lesser degree, on the wage level dimensions of relational signalling. This may indicate that, in addition, the companies of Cluster 4 have sophisticated internal labour markets, which are also a characteristic of large, bureaucratic organisations (Bridges and Villemez 1994). To test further the idea that the Cluster 4's high relational signalling scores are not a reflection of these companies' efforts to engage in comparatively high relational signalling *per se,* but in fact reflect the extent of bureaucracy of these companies, it would be expected that correlates of formal bureaucracy, when included in a multinomial regression analysis, will discriminate Cluster 4 from the other clusters. Tables 5.9 and 5.10 outline the results of such a regression for the Irish and Dutch samples.

Table 5.9 Multinomial regression, Ireland

Variable	Cl 2 ß (p-value)	Cl 3 ß (p-value)	Cl 4 ß (p-value)	Cl 5 ß (p-value)	Cl 6 ß (p-value)	Likelihood Ratio test
Union	1.08 (.37)	-.06 (.24)	3.55 (.03)	1.27 (.27)	1.4 (.31)	215.34 (.136)
Age	-.13 (.79)	.82 (.07)	1.13 (.16)	.70 (.14)	.69 (.23)	217.17 (.072)
Size	-2.3 (.49)	-.72 (.06)	.11 (.83)	-1.27 (.00)	-.46 (.32)	222.50 (.009)
Sector				.		243.13 (.002)
Process	1.23 (.39)	-18.10 (.99)	2.12 (.17)	1.06 (.45)	-18.0 (.)	
Food & textiles	-18.59 (.99)	-1.73 (.21)	-.62 (.64)	-.10 (.92)	-.28 (.82)	
Service	1.18 (.25)	.42 (.68)	-2.51 (.24)	-1.99 (.17)	-.30 (.83)	
Total X^2						68.15
McFadden R^2						.24

[1] Reference categories: Metal and electric and Cluster 1

Table 5.9 outlines the results of a multinomial regression of the correlates of bureaucracy and other control variables on the six cluster solutions for the Irish data. As the likelihood ratio test indicates, sector and size significantly differ between the clusters. It is generally recognised that size and bureaucracy or formalisation are highly correlated. As shown, the effect of size on Cluster 4 membership is the largest of all clusters. Another indicator of bureaucratisation is the age of the company. Here it is indicated that the longest-established companies most likely belong to Cluster 4. Finally, collective contracting is considered a major force formalising the employment relationship. Again, highly unionised companies are more likely to belong to Cluster 4 than to any other cluster. Since all three proxies for bureaucratisation are closely associated with the fourth cluster, the Irish data are very supportive of the hypothesis that the high relational signalling scores of cluster 4 companies are due to the bureaucratic nature of these companies.

Table 5.10: Multinomial regression. Netherlands

Variable	Cl 2 ß (p-value)	Cl 3 ß (p-value)	Cl 4 ß (p-value)	Cl 5 ß (p-value)	Cl5 ß (p-value)	Likelihood Ratio test
Union	1.79 (.13)	.91 (.41)	2.46 (.02)	2.61 (.012)	2.09 (.08)	941.02 (.053)
Age	-.19 (.56)	.05 (.85)	-.19 (.53)	-.144 (.60)	-.18 (.57)	931.83 (.883)
Size	-.68 (.03)	-.30 (.20)	-.11 (.63)	-1.03 (.00)	-.97 (.00)	957.67 (.000)
Sector						955.97 (.169)
Process	-1.51 (.20)	-1.95 (.09)	-1.92 (.11)	-1.53 (.20)	-.92 (.48)	
Food & textiles	-3.28 (.01)	-2.5 (.03)	-2.11 (.07)	-1.40 (.22)	-1.22 (.33)	
Service	-1.37 (.24)	-1.79 (.12)	-1.25 (.28)	-.69 (.54)	-.74 (.56)	
No answer	-2.50 (.06)	-1.57 (.19)	-1.63 (.19)	-1.78 (.15)	-1.25 (.36)	
Total X^2						64.25
McFadden R^2						.06

Table 5.10 outlines the results of a multinomial regression of the correlates of bureaucracy and other control variables on the six cluster solutions using the Netherlands data. The likelihood ratios here indicate that the most important factors in the formation of the clusters are the size of companies and the extent to which collective bargaining is institutionalised. As in the Irish data, the effects of being a larger company and of having larger union presence are strongest for Cluster 4 companies. Of all six clusters, only Cluster 1 is more strongly associated with size and only Cluster 5 is more associated with unionisation than the fourth cluster.

Both data sets provide much evidence for the claim that a bureaucratic structure or approach is a feature of Cluster 4. In Ireland, larger, older companies in which norms of collective bargaining are highly institutionalised appeared in the fourth cluster. In the Netherlands union presence and size are also supportive, but age as a factor that does not discriminate between the clusters. That the influence of age is more decisive in the Irish than in the Dutch case is not surprising, given the

entirely different economic and social contexts in question. The Netherlands has a long history of healthy and relatively stable political and economic experience, and this history is reflected in the country's elaborate industrial policy. In contrast, it was not until the 1980's that a general consensus supported the creation of a competitive, trading economy in Ireland.

2.3.5 Do Clusters 4, 5 and 6 differ substantially?

An examination of data details reveals that the main significant departure between the cluster centres of the two solutions arises due to the fact that Cluster 5 in Ireland exhibits substantially higher mean scores for the variables 'training' and 'selectivity'. In the case of training, the cluster mean 'shifts' from -.68 to -.14 and, in the case of selectivity, this shift is from .08 to .50. Since the re-clustering of Irish companies yields a Cluster 5 that invests more in training and employee selection than the companies classified as Cluster 5 on the basis of the pooled data, the question is whether the 'Irish' Cluster 5 companies should still be considered non-users of the high performance HR bundle.

Table 5.11 reports the cluster means of a high performance HR bundle score (which is the sum of all five HR practices) for the pooled data and for the country specific partitionings (columns entitled '1'). As the score indicates, the 'Irish' Cluster 5 is still the cluster with the second lowest score of all the clusters. As argued above, the high relational signalling score of Cluster 4 is regarded as a reflection of the degree of company bureaucratisation. Even when each cluster's relational signalling score is subtracted from its high performance HR score, (columns entitled '2'), the cluster mean of the Irish Cluster 5 is still closer to the low investment clusters (4 and 6) than to the selective investment cluster. An inspection of the stability of cluster membership confirms this impression. Of the original eighteen companies in Ireland that belong to Cluster 5 under the pooled data classification, fifteen are re-classified as Cluster 5 companies, while the remaining three are allocated to the other two non-high performance HR users when country-specific (Ireland) pooling is used (not reported). Consequently, one can conclude that Cluster 5 can be considered as one of the non-high performance HR bundle clusters.

Table 5.11: High performance HR scores per cluster

	Cluster	**Pooled**		**Netherlands**		**Ireland**	
		1[1]	2[2]	**1**	2	**1**	2
High-Invest	1	5.20	4.68	5.01	4.53	5.33	4.57
Select-Invest	2	2.19	2.05	2.21	2.01	2.23	2.15
	3	1.75	0.95	1.65	0.90	1.73	0.90
Low Invest	4	-0.42	-1.11	-0.42	-1.13	-.97	-1.29
	5	-2.06	-1.17	-2.10	-1.30	-1.68	-0.27
	6	-5.35	-4.61	-5.49	-4.78	-4.35	-3.46

[1] Country specific partitioning
[2] Scores adapted for relational signalling

3.0 Summary and conclusions

Chapter 2 outlined the five most salient components of the high performance HR bundle. The first of these involves forms of compensation that link rewards to performance and/or to training, the second component sees companies guiding their employees in terms of their role and career orientation. Such generous benefits as extensive perquisites and fringe benefits, along with paying employees above the average industry wage were suggested as the third component of the bundle. The fourth involved the extent to which companies engage in on on-the-job and off-the-job training of employees and finally, the fifth sees companies carefully screening their applicants for the purpose of assisting in the identification of high calibre recruits. Together these five practices comprise the high performance HR bundle.

In terms of the expectations of the use of these practices, it was thought that the complementarity potential from applying the five practices simultaneously, would be of great appeal to a firm. When faced with the choice of using an alternative to the full complement of five practices, it was expected that companies would be

reluctant to use less than the five practices. Using less than the full complement would require the firm to invest in a set of practices that exhibits a complementarity potential dramatically lower than that reached by the full bundle. The most likely or feasible alternative was expected to be therefore that companies would opt to use none of the practices.

Using a two-stage clustering procedure on pooled data, six different types of HR management were identified. An examination of the scores of the high performance HR bundle scores of the clusters suggested that these six types could be meaningfully re-grouped into three distinct groups of HR approaches. In accordance with the hypothesis specified in this chapter, one of these approaches is characterised by an extensive use of all five HR practices. This was designated the high performance HR bundle. Only a minority of companies in both countries actually use this high performance HR bundle. In Ireland, this share is 14 percent and, in the Netherlands, it is 9 percent (see Table 5.7). In both countries, larger companies and companies with low union density tend to adopt the high performance HR bundle. In Ireland, full adoption is also more prevalent among more recently established companies.

Also in agreement with the hypothesis of a bi-modal distribution there were three further clusters that have in common that the companies contained in the clusters, hardly use any of the HR practices. Consequently this was considered to fit the profile of the expected low users. The first cluster belonging to this group has far below average scores on all five HR practices. Nine percent of the companies in the Irish sample and 10 percent of the companies in the Dutch sample, belong to this cluster. Amazingly, there are no strong correlates of this cluster in either country. It could possibly be that smaller companies in the Netherlands are over-represented in this cluster. The second cluster in this group is characterised by high values of relational signalling in combination with low values on all other HR practices. Fourteen percent of the Irish and 17 percent of the Dutch companies were classified into this cluster (Table 5.7).

In both countries, larger companies with strong union presence tend to use this low form of HR management. In Ireland, longer established companies also adopt this bundle more frequently. This result supports the hypothesis that this bundle belongs to a group of the low or non-users of the high performance HR practices. The high scores on relational signalling appear to be an artefact of the degree of bureaucratisation characterising these companies. Finally, a third cluster was allocated into this low user group. This cluster is characterised by a group of companies that make modest use of the HR practices. The Dutch companies in this cluster use some selection and incentives while the Irish also provide some training to their employees. However, in none of these practices do the scores of this cluster reach the average score. This cluster contained the most companies with 22 percent of the Irish and 30 percent of the Dutch sample being represented in this cluster. In both countries this type of HR management is more prevalent in smaller companies. In the Netherlands, low union presence is also a predictor of this type of HR management approach. Taking these three clusters together, 46 percent of the companies based in Ireland and 57 percent of the companies in the Netherlands were classified as having no distinctive high performance HR management approach.

Contrary to the main hypotheses in this chapter, there were also companies that were characterised by a selective adoption of high performance HR practices. Two different clusters were distinguished here. The first uses incentives, relational signalling and selection quite extensively but neglect training and guidance. Twenty percent of the Irish and 21 percent of the Dutch companies use this HR approach. In both countries this cluster is comprised of companies that are largely non-unionised but are quite well established. The second employs incentives, training and selection practices, neglecting relational signalling and guidance. Twenty-two percent of the Irish and 13 percent of the Dutch companies use this HR approach.

In Ireland smaller and more recently established companies, as well as companies that are located in service sectors, use this selective form of HR management. In the Netherlands, there is no clear relationship with any of the correlates, with the

exception that this approach is under-represented in manufacturing companies. In taking these two clusters together, 42 percent of the Irish and 34 percent of the Dutch use selective HR bundle.

The overall pattern revealed by the cluster analyses does not completely fit the hypothesis that the distribution of HR management types is bi-modal in the sense that companies either use the 'full monty' of the five HR practices in order to realise the complementarity effects, or reject the adoption of any of these practices. It was found, rather, that a substantial share of companies adopt hybrid forms of HR management - that is the selective approach to HR management. This finding can be explained in two ways. It is possible that the theory of complementarity between the five HR practices is unjustified. Whether there is evidence of a complementarity effect will be held up for scrutiny in the next chapter. Another explanation is that the adoption of high performance HR practices is not, as was suggested in the beginning of this chapter, guided by pure 'efficiency' considerations. In Chapter 8, a theoretical model will be developed in order to incorporate the adoption of hybrid forms of high performance HR management as a consequence of reputation seeking. This model will also be tested on the data.

APPENDIX I

Notes [1,2,3]

The explained variance specifies the extent to which a solution with K clusters improves the solution with one cluster. The **PRE coefficient** generalises this idea. It compares the K cluster solution with the previous solution using (K-1) clusters. PRE is defined as:

$$PRE_K^2 = 1 - \frac{SS_{within}(K)}{SS_{within}(K-1)}.$$

The PRE coefficient ignores the fact that more clusters automatically result in a better fit, expressed in a higher explained variance. A solution with K2 > K1 clusters will always have a higher explained variance (except a local minimum was found).

The **F-Max** statistic corrects this 'defect'. It is defined as:

$$F - MAX_K = \frac{SS_{between}(K)/K-1}{SS_{within}(K)/n-K} = \frac{\left(SS_{total} - SS_{within}(K)\right)/K-1}{SS_{within}(K)/n-K}$$

F-Max has no F distribution, because $SS_{within}(K)$ is minimized by k-means (see above).